Joint CEOS-CGMS Working Group on Climate Status, Next Steps and Key Recommendations for CGMS Plenary

Presented to CGMS-53 Plenary session 4, agenda item JWGCLIM-WP-05

Wenying Su, NASA
Vincent-Henri Peuch, ECMWF
on behalf of the WGClimate

Executive summary: WGClimate Activities and Key Initiatives

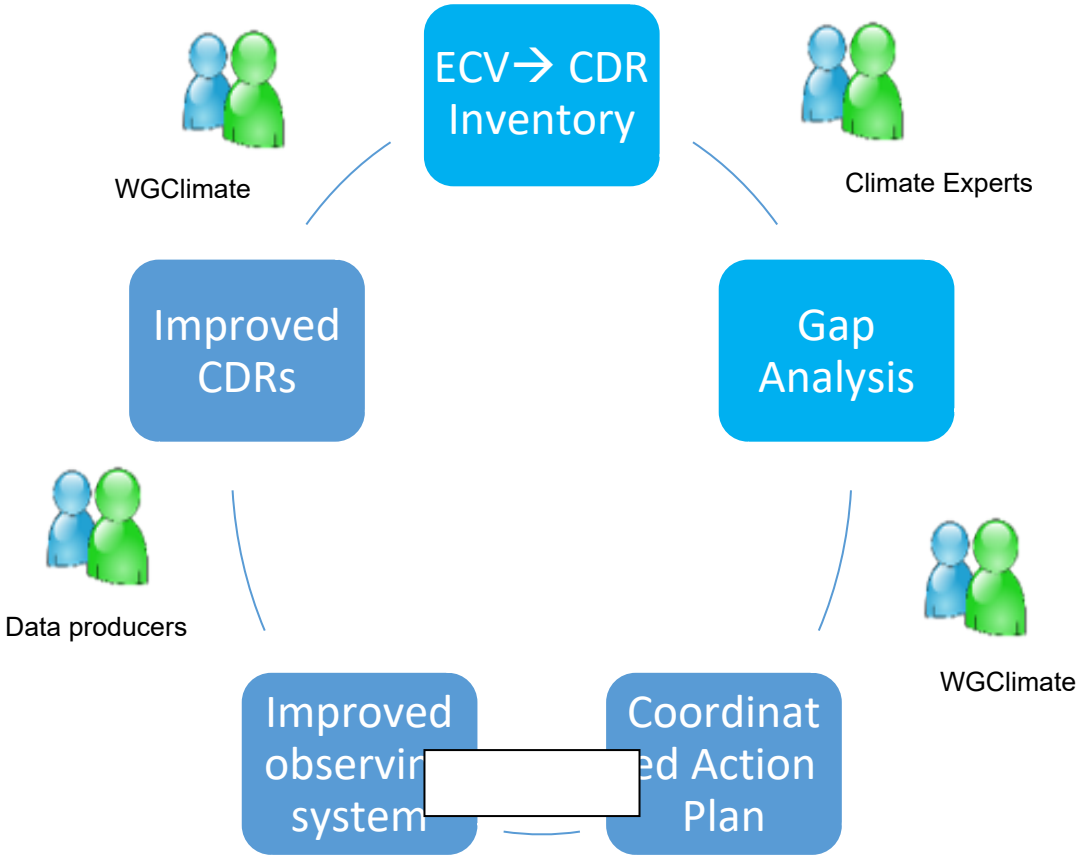
WGClimate is advancing efforts to enhance the use of Earth observations in global climate research and assessments:

- GCOS Implementation Plan: WGClimate finalized the space agencies' responses to the GCOS Implementation Plan 2022. The consolidated response was endorsed by CEOS and CGMS in April 2025.
- Global Stocktake (GST) Contributions: WGClimate led a lessons learned review to improve systematic observation uptake for GST2 (2028). "Lessons Learned and Recommendations from Space Agencies' Support for the First Global Stocktake" was endorsed by CEOS and CGMS in April 2025.
- UNFCCC Engagement Tiger Team was established to strengthen CEOS and CGMS coordination at key UNFCCC events and a workshop with UNFCCC was held on April 30, 2025.

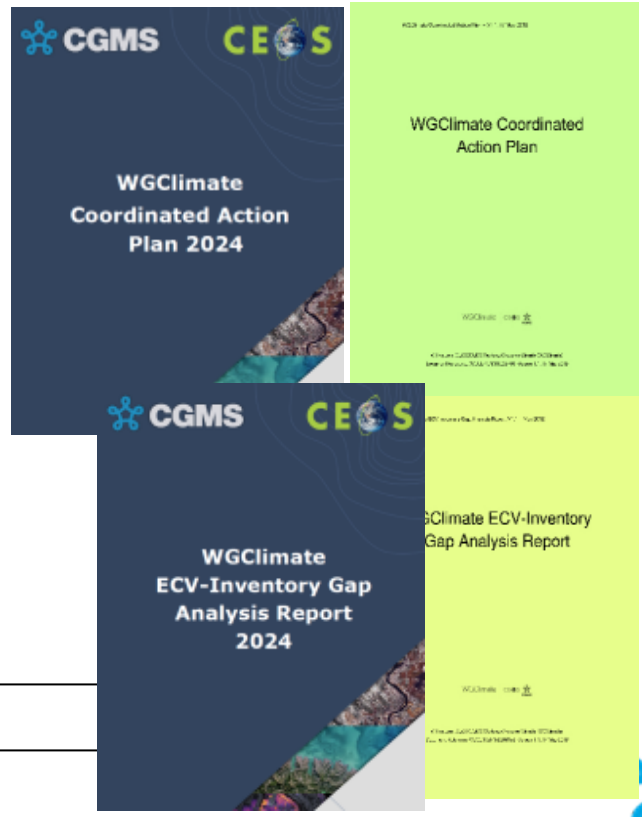
These efforts ensure stronger climate monitoring, improved international coordination, and greater impact of satellite data in supporting decision-making.

Overarching Workflow for WGClimate

ECV Inventory (reference versions)
v2.0, October 2017 (917 records, 31 ECVs)
…
v5.0, October 2024 (1289 records, 36 ECVs)

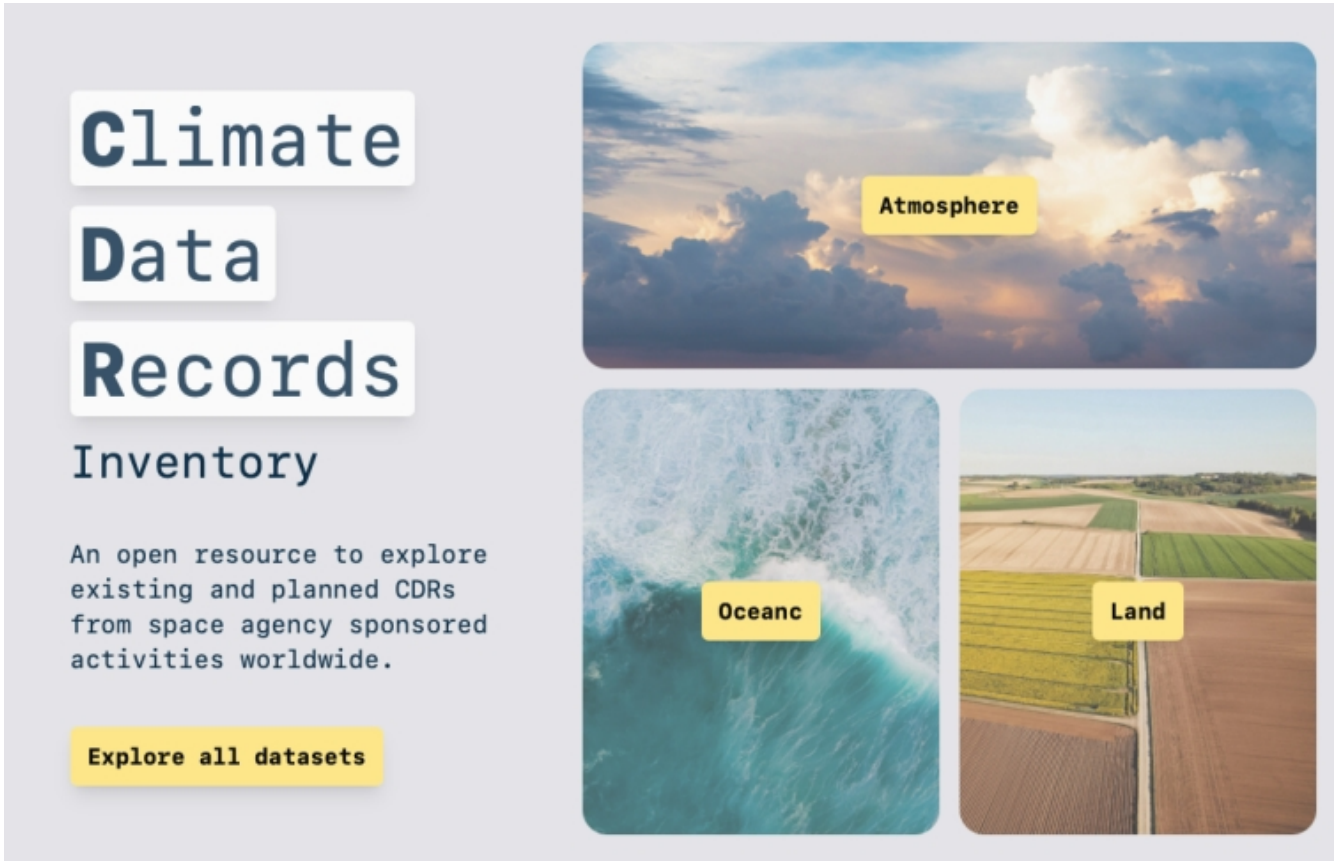


Gap Analysis & Coordinated Action Plan
2018, based on ECV Inv v2.0
2024, based on ECV Inv v3.0 + v4.1



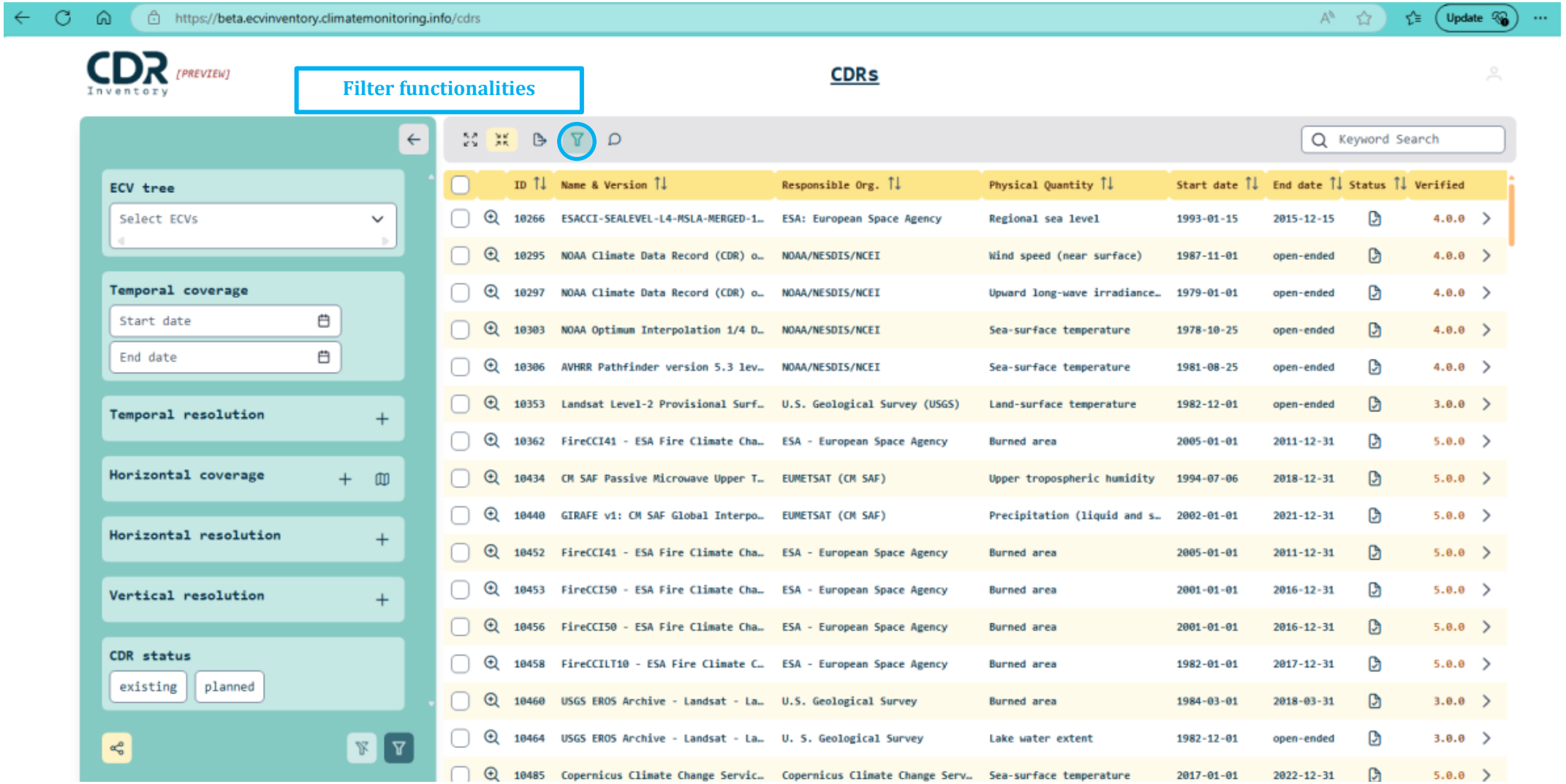
Transition to CDR Inventory

- New technical baseline to enhance discoverability and uptake of CDR Inventory by external users
- Added functionalities to make it easier to navigate the Inventory
- Simplified process to populate the database and verify the contents
- Continuous publication, individual time tags used for record updates.
- Accommodation of non-GCOS climate-relevant variables → starting with fundamental data records

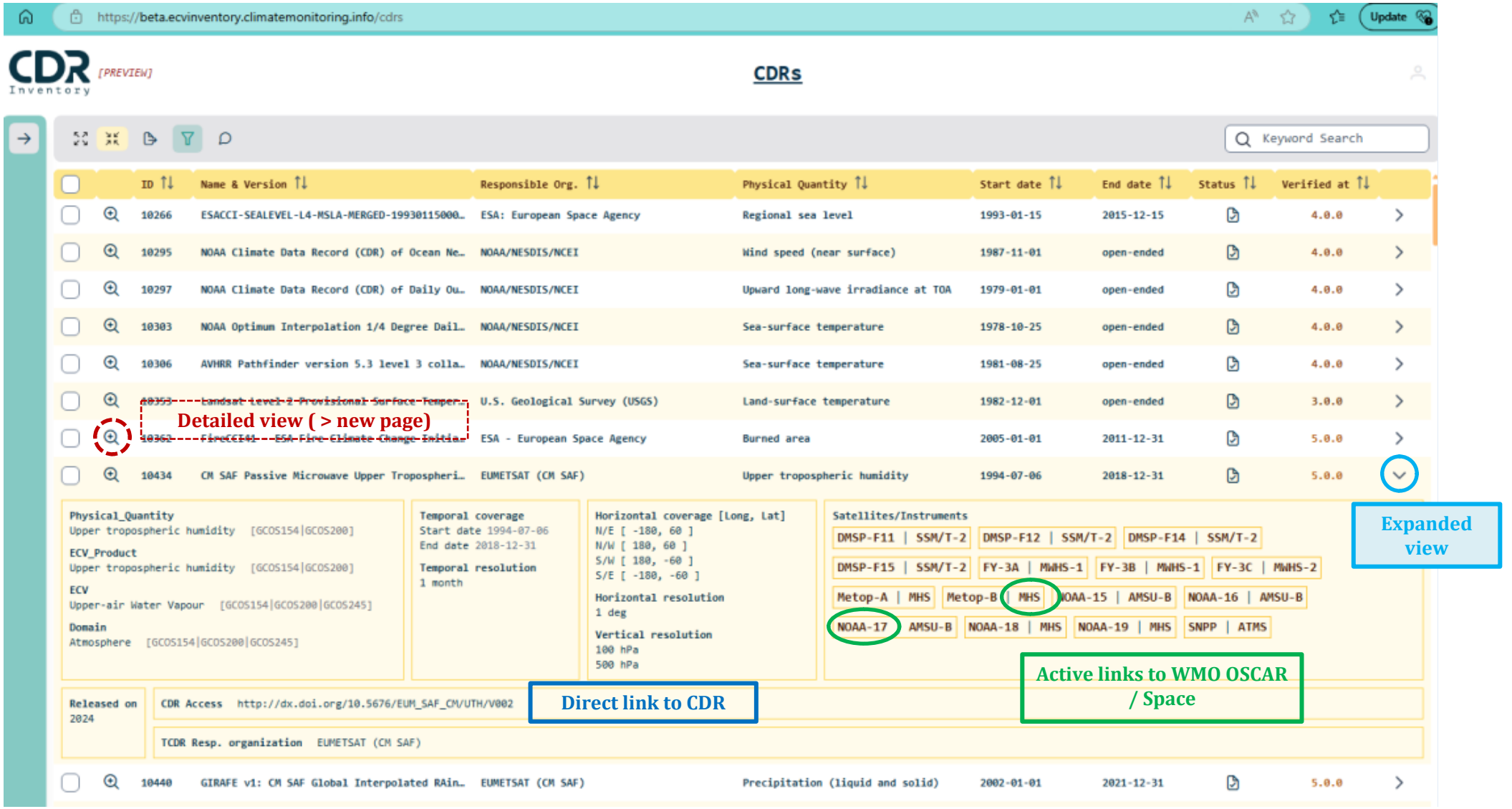


Appreciate EUM and EC continued support for this activity.

Transition to CDR Inventory



Transition to CDR Inventory



Joint WGClimate and GHG Task Team meeting

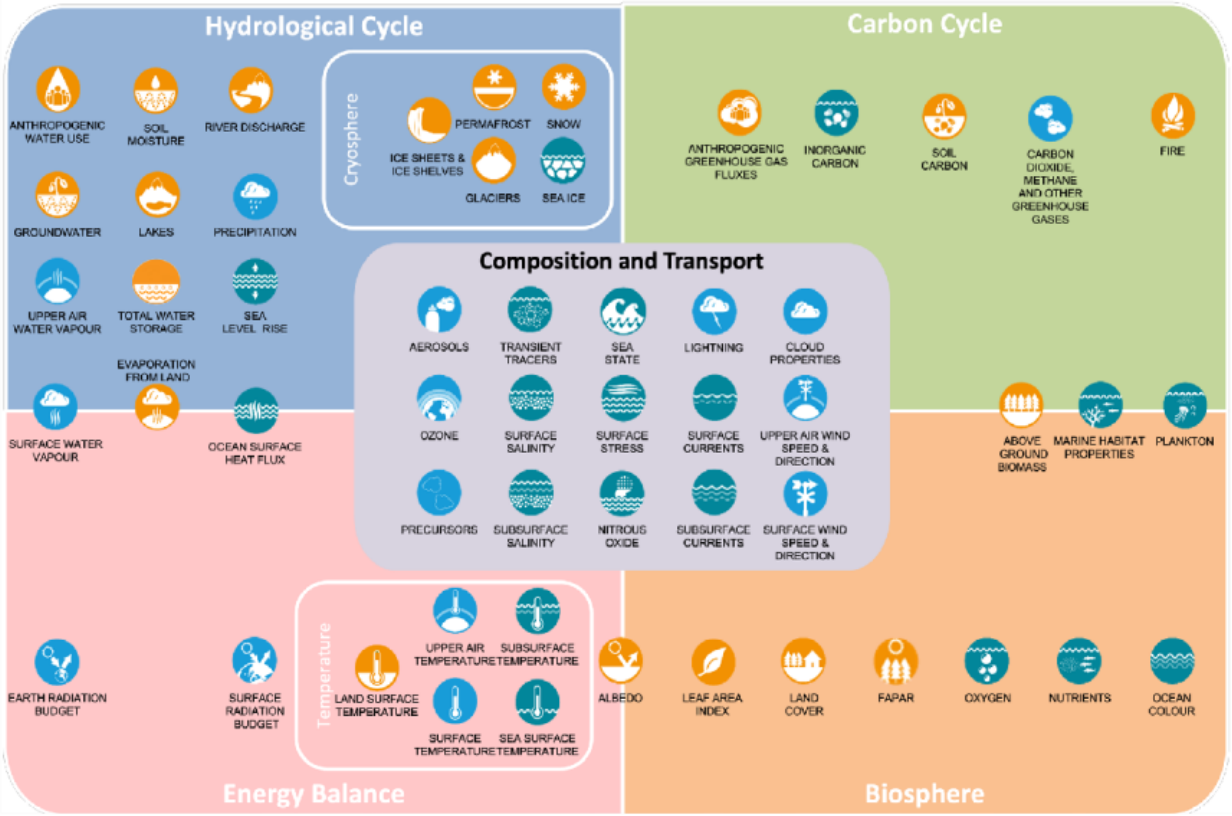
- The WGClimate and its Greenhouse Gas Task Team meeting was successfully held in Harwell, U.K. from February 11-13, 2025.
- The meeting had 43 in-person participants and 34 virtual participants, including representatives from the CEOS chair team, SIT chair team, and five national GHG inventory communities.

Outcomes from the meeting

- WGClimate, in collaboration with other organizations, to consider establishing regional satellite data experts to advise national inventory compilers.
- Representatives from World Climate Research Programme (WCRP) also attended the WGClimate meeting in Harwell and expressed their interest in working more closely with WGClimate to support initiatives such as Earth System Modelling and Observations (ESMO) and the Coupled Model Intercomparison Project (CMIP).

Expanding the utility of CDR Inventory to address emerging priorities

- Application/stakeholder typology
- Science (Cycles, Climate modelling (EMSO, CMIP), attribution, tipping points, Global Carbon Project, EW4ALL, Solar Radiation Management, …)
- Policy/Decision support:
  - Climate adaptation (Urban, Natural Based Solution, water resource management, energy management, Solar Radiation Management, …)
  - Mitigation (GHG, AFOLU, Blue Carbon, …)

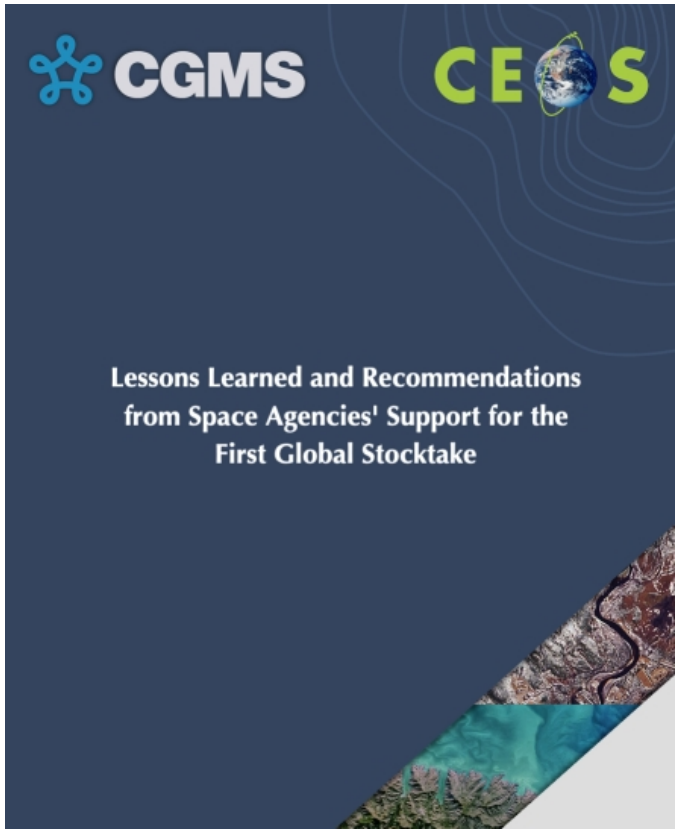


Space Agencies' Response to the 2022 GCOS Implementation Plan

- Provided responses to 48 activities.
- Feedback from GCOS panels addressed.
- Appreciate the comments and clarification that we have received so far from the GCOS panels.
- Represents collective efforts from major space agencies, with the goal to provide a comprehensive response to each of those activities.
- Endorsed by CEOS and CGMS in April 2025.
- Update the living document at the end of 2025 to provide most up-to-date inputs to the next GCOS Status Report.

Lessons Learned and Recommendations for the GST1

- CEOS provided the pilot top-down CO2 and CH4 inventories to support GST1 in 2023.
- Received positive recognition at international settings, but few national inventory compilers have adopted these satellite-based data to support inventory development or for quality assurance or quality control.
- CEOS & CGMS are reevaluating their approach to inform future efforts. The lessons learned and corresponding recommendations are categorized into three key areas:
  - GHG flux datasets
  - Stakeholder engagement
  - Communication
- “Lessons Learned and Recommendations from Space Agencies’ Support for the First Global Stocktake” is endorsed by CEOS and CGMS in April 2025.



UNFCCC Engagement Coordination Tiger Team

- Ensure consistent preparation across CEOS and CGMS agencies for Earth Information Days.
- Enhance coordination at key UNFCCC events throughout the year.
- Develop a comprehensive multi-year engagement strategy aligned with the phases of the GST process, including proactive supports for party submissions.
- Define key objectives for each Conference of the Parties (COP) and Earth Information Day (EID) to ensure CEOS and CGMS efforts are strategic and aligned with broader climate goals.

UNFCCC and WGClimate engagement workshop

- A dozen participants on both UNFCCC and WGClimate sides attended the workshop on April 30, 2025.
- UNFCCC secretariat from different divisions presented on six workstreams:
  - Collective Progress
  - Adaptation, Loss and Damage
  - Capacity Building
  - Mitigation
  - Climate Technology
  - Transparency
- The workshop resulted in the following actions:
  - Share email contacts of participants from both sides.
  - CEOS-CGMS are invited to provide feedback on the proposed adaptation indicators by June 16, coinciding with the start of the Bonn Climate Change Conference (SB-62).
  - WGClimate is requested to nominate lead person(s) for each specific workstream to help facilitate further discussions and support ongoing efforts.
  - Establish an annual meeting with the full group to review progress and developments across the various workstreams.

Key issues of relevance to CGMS:

- "Space Agency Response to the 2022 Global Climate Observing System Implementation Plan" was endorsed by CEOS and CGMS in April 2025 (HLPP 5.3).
- "Lessons Learned and Recommendations from Space Agencies' Support for the First Global Stocktake" was endorsed by CEOS and CGMS in April 2025 (HLPP 5.7).
- ECV Inventory is now transitioned to CDR Inventory with a new user interface to make it easier to navigate and more flexible (HLPP 5.1).
- Established the UNFCCC engagement coordination Tiger Team to strengthen CEOS and CGMS coordination at key UNFCCC events (HLPP 5.2).
- CGMS liaison to WGClimate's GHG task team has been involved in the development of the Issue 2 of the GHG Roadmap. A follow-up meeting between CGMS working groups, WGClimate and its GHG task team was held on June 2, 2025 to coordinate on GHG observations (HLPP5.6).